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➤ SHORT METHODS ➤

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— FOR —

COMPUTING

INTEREST AND DISCOUNT.

100 DAYS INTEREST RULE.

BY

HENRY GOLDMANN,

Author of the "Electric Detector," Etc.

NEW YORK.

1884.

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❖ INTEREST ❖

Is the money paid for the use of money: **PRINCIPAL**, the money on which interest is paid; **RATE OF INTEREST**, the number of per cent., and **AMOUNT**, the principal plus the interest.

To find the interest if the time is given in days.

100 DAYS INTEREST RULE.

1. Divide the principal by one of the key numbers of the following table, according to the rate.

2. Add to or subtract from the result the part which the corresponding column indicates.

The answer is the interest of the given principal at the given rate for 1, 10 or 100 days, according to how many places to the left the decimal point is removed. 1 place for 100 days, 2 places for 10 days, 3 places for 1 day. To obtain the interest for any given number of days, multiply the hundreds, tens or units of days by the corresponding amount of interest and add the products together.

NOTE.—The key numbers for the most frequent rates can be easily kept in mind. The parts have to be taken of the result of the division by the key number, and not of the principal. Where no part is indicated, the division by the key number is sufficient.

To find the interest if the time is given in years :

Multiply the principal by the product of the number of years and the rate, and remove the decimal point two places to the left.

EXAMPLE.

\$630 at 8% for 3 years.

$$\begin{array}{r} 8 \times 3 = 24 \qquad 630 \\ \qquad \qquad \qquad 24 \end{array}$$

Answer, \$151.20

To find the interest for 1 year, multiply the principal by the rate, and remove the decimal point two places to the left.

To find the principal :

1. *If the time is given in days*, multiply the interest by 36, divide by the product of the number of days and the rate and remove the decimal point three places to the right.

2. *If the time is given in months*, multiply the interest by 12, divide by the product of the number of months and the rate and remove the decimal point two places to the right.

3. *If the time is given in years*, divide the interest by the product of the number of years and the rate, and remove the decimal point two places to the right.

To find the rate :

Apply the rules given for finding the principal, substituting the principal for the rate.

To find the time :

1. *In days*, multiply the interest by 36, divide by the product of the principal and the rate, and remove the decimal point three places to the right.

2. *In months*, multiply the interest by 12, divide by the product of the principal and the rate, and remove the decimal point two places to the right.

3. *In years*, divide the interest by the product of the principal and the rate, and remove the decimal point two places to the right.

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NOTE.—The key numbers for the most frequent rates can be easily kept in mind. The parts have to be taken of the result of the division by the key number, and not of the principal. Where no part is indicated, the division by the key number is sufficient.

TABLE.

RATE.	Key Number	PART	
Per cent.	Divide by	to be added	to be deducted.
2	18	One-sixth	
3	12		
3½	12		
4	9		
4½	8		
5	6	One-sixth.	One-twelfth.
5½	6		
6	6	One-twelfth.	One-sixth.
6½	6		
7	6	One-sixth.	
7½	6	One-quarter.	
8	6	One-third.	
9	4		One-sixth.
10	3		
11	3		
12	3		One-twelfth.

EXAMPLE.

\$136.43 at 5% for 113 days.

6)136.43	Interest for 100 days, 1.895...	\$1.90
22.73	" " 10 " 0.189...	19
— 3.78	" " 3 " 0.056...	6
18.95	Interest for 113 days =	\$2.15

Short Interest Rule.

For the following rates and the corresponding number of days the interest is found without any calculation, by simply removing the decimal point of the principal two places to the left.

1 %.....	360 days.	5 %.....	72 days.
1½ ".....	210 "	6 ".....	60 "
2 ".....	180 "	7½ ".....	48 "
2½ ".....	144 "	8 ".....	45 "
3 ".....	120 "	9 ".....	40 "
4 ".....	90 "	10 ".....	36 "
4½ ".....	80 "	12 ".....	30 "

EXAMPLE.

\$365.44 at 6% for 54 days.

\$3.65 6% for 60 days.
— .37 6% " 6 "

\$3.28 6% for 54 days.

The "100 Days Interest Rule" permits a general application, while the "Short Interest Rule" will be found practical in a number of special cases. Both rules combined give an interest method, which has no equal.

To find the interest for several items at once:

Multiply each item* by the given number of days, add the products together and divide the sum by one of the following key numbers, according to the rate:

Rate	Key No.	Rate	Key No.
1 %.....	360	6 %.....	60
1½ ".....	240	7 ".....	51
2 ".....	180	7½ ".....	48
2½ ".....	144	8 ".....	45
3 ".....	120	9 ".....	40
4 ".....	90	10 ".....	36
4½ ".....	80	12 ".....	30
5 ".....	72	18 ".....	20

To find the interest if the time is given in months:

Multiply the number of months by 30, which gives the corresponding number of days† and apply the "100 Days" or the "Short Interest Rule."

EXAMPLE.

\$125 at 7% for 3 months and 12 days.

6)125.00,	3×30+12=102 days.
20.83,	Interest for 100 days=\$2.43
+ 3.47,	" " 2 " = 5
24.30,	Interest for 102 days=\$2.48

*Cents can be omitted, if less than 50; if more, should be counted for one dollar.

†In case that there are months and days given, add the number of the given days to this product.

To find the interest if the time is given in years:

Multiply the principal by the product of the number of years and the rate, and remove the decimal point two places to the left.

EXAMPLE.

\$630 at 8% for 3 years.

8×3=24 630
 24

Answer, \$151.20

To find the interest for 1 year, multiply the principal by the rate, and remove the decimal point two places to the left.

To find the principal:

1. If the time is given in days, multiply the interest by 36, divide by the product of the number of days and the rate and remove the decimal point three places to the right.

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To find the rate:

Apply the rules given for finding the principal, substituting the principal for the rate.

To find the time:

1. In days, multiply the interest by 36, divide by the product of the principal and the rate, and remove the decimal point three places to the right.

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3. In years, divide the interest by the product of the principal and the rate, and remove the decimal point two places to the right.

➤ DISCOUNT ◀

Is an allowance for the payment of money before it becomes due. It must always be deducted from the face of a bill, note, etc., while interest is, as a rule, added to the given principal.

Discount is figured at a certain rate, either without any given time, in which case one year is taken as the basis, or for a given number of days. The rules for computing interest find application in both cases.

LIST DISCOUNT

Is a deduction from the list price or the amount of a bill, customary in many branches of business.

If only a single rate should be deducted, the net price or net amount is easily obtained by simply subtracting the rate from 100, multiplying the list price or the given amount by the difference, and removing the decimal point of the product two places to the left.

EXAMPLE.

List price, \$42.00 ; list discount, 15%.

100	42
— 15	85
—	—
85	210
	336
	—

Answer, \$35.70 Net price.

If several rates should be deducted successively, subtract each of the given rates from 100, multiply the differences, and place the decimal point in front of the product. The list price or the amount of bill multiplied by this product gives the desired net price or net amount.

EXAMPLE.

Amount of bill, according to list prices, \$425.00

List discount, 40%, 20% and 5%.

$$\begin{array}{r}
 100 \qquad 100 \qquad 100 \\
 - 40 \qquad - 20 \qquad - 5 \\
 \hline
 60^* \times 80^* \times 95 = 456,000^* \\
 \begin{array}{r}
 425 \\
 .456 \\
 \hline
 2550 \\
 2125 \\
 1700 \\
 \hline
 193.800
 \end{array}
 \end{array}$$

Answer, \$193.80 Net amount.

PROFIT AND LOSS.

Some important questions, frequently occurring in business, find their practical solution in the following lines:

To ascertain the rate of the profit or loss, if the buying price is taken as basis :

Multiply the difference between the buying and the selling price by 100, and divide the product by the given buying price.†

To ascertain the rate of the profit or loss, if the selling price is taken as basis :

Multiply the difference between the buying and the selling price by 100, and divide the product by the given selling price.†

*Ciphers in the lowest places don't need to be considered.

†If the selling price is larger than the buying price, the answer is a profit. If the buying price is larger than the selling price, the answer is a loss.

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EXAMPLE.

List price, \$12.00; list discount, 15%.

100	42
— 15	85
85	210
	336

Answer, \$35.70 Net price.

If several rates should be deducted successively, subtract each of the given rates from 100, multiply the differences, and place the decimal point in front of the product. The list price or the amount of bill multiplied by this product gives the desired net price or net amount.

EXAMPLE.

Amount of bill, according to list prices, \$425.00

List discount, 40%, 20% and 5%.

100	100	100
— 40	— 20	— 5
60*	80*	95 = 456,000*

425	
.456	
2550	
2125	Answer, \$193.80 Net amount.
1700	
193.800	

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To gain on the buying

5	%	multiply the same by 21, and divide the product by 20	11,	"	"	10
10	"	"	9,	"	"	8
12½	"	"	23,	"	"	20
15	"	"	12,	"	"	10
20	"	"	5,	"	"	4
25	"	"	13,	"	"	10
30	"	"	4,	"	"	3
33½	"	"	27,	"	"	20
35	"	"	14,	"	"	10
40	"	"	29,	"	"	20
45	"	"	15,	"	"	10
50	"	"	16,	"	"	10
60	"	"	5,	"	"	3
66½	"	"	17,	"	"	10
70	"	"	18,	"	"	10
80	"	"	19,	"	"	10
90	"	"		"	"	

The profit on the buying price can reach any number of per cent.

To gain on the selling price:

5	%	multiply the buying price by 20, and divide the product by 19	10,	"	"	9
10	"	"	8,	"	"	7
12½	"	"	20,	"	"	17
15	"	"	10,	"	"	8
20	"	"	4,	"	"	3
25	"	"	10,	"	"	7
30	"	"	3,	"	"	2
33½	"	"	20,	"	"	13
35	"	"	10,	"	"	6
40	"	"	20,	"	"	11
45	"	"	2,	"	"	1
50	"	"	10,	"	"	4
60	"	"	3,	"	"	1
66½	"	"	10,	"	"	3
70	"	"	10,	"	"	2
80	"	"	10,	"	"	1
90	"	"		"	"	

The profit on the selling price can never reach 100%, for in this case the buying price is reduced to nothing.

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25	"	"	5,	"	4
30	"	"	13,	"	10
33½	"	"	4,	"	3
35	"	"	27,	"	20
40	"	"	14,	"	10
45	"	"	29,	"	20
50	"	"	15,	"	10
60	"	"	16,	"	10
66⅔	"	"	5,	"	3
70	"	"	17,	"	10
80	"	"	18,	"	10
90	"	"	19,	"	10

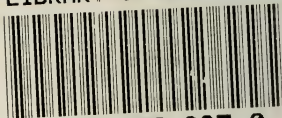
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35	"	"	20,	"	13
40	"	"	10,	"	6
45	"	"	20,	"	11
50	"	"	2,	"	1
60	"	"	10,	"	4
66⅔	"	"	3,	"	1
70	"	"	10,	"	3
80	"	"	10,	"	2
90	"	"	10,	"	1

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